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1. JP409065878A, Mar. 11, 1997, **\*\*LONG\*\*-\*\*CHAIN\*\* \*\*PRENYL\*\*  
\*\*DIPHOSPHATE\*\* \*\*SYNTHASE\*\***; ONUMA, SHINICHI, et al.,  
INT-CL: C12N9/10; C07H21/04; C12N1/19; C12N15/09; C12P9/00

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ABSTRACT:

PROBLEM TO BE SOLVED: To obtain a new prenyl diphosphate synthase comprising an amino acid at a specific part in a geranylgeranyl diphosphate synthase derived from *Sulfolobus acidocaldarius*, capable of a prenyl diphosphate synthase such as a steroid precursor, etc.

SOLUTION: This new variation type enzyme comprises at least one of Phe at the 77 position, Met at the 85 position, Val at the 99 position, Tyr at the 101 position, Phe at the 118 position, Arg at the 199 position and Asp at the 312 position replaced with another amino acid in a geranylgeranyl diphosphate synthase derived from *Sulfolobus acidocaldarius* and is capable of forming a  $\geq 25$ C prenyl diphosphate synthase. Otherwise a new variation type enzyme is modified by replacement with, deficiency in and/or addition of one or a few amino acids, maintains the enzyme activity. The enzyme is useful for synthesizing a **\*\*long\*\*-\*\*chain\*\* \*\*prenyl\*\* \*\*diphosphate\*\* \*\*synthase\*\*** such as a steroid precursor, carotenoid, etc.

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